

## Financial Crisis, Fiqh Muamalat and International Commutative Transactions: An Empirical Assessment of the Value of Contemporary Currency in Light of the Prohibition against *Gharar*

(Krisis Kewangan, Muamalat Fiqah dan Transaksi Komutatif Antarabangsa: Satu Penilaian Empirikal  
Mengenai Nilai Mata Wang Semasa dengan Mengambil Kira Larangan terhadap *Gharar*)

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### ABSTRACT

*Financial crises are common facets of the contemporary economic environment. The present study examines the effects of the 1997 Asian Financial Crisis on the value of the Indonesian Rupiah (IDR) against the US Dollar (USD) over a 186-month period, including the 12-month period prior to the formal beginning of the financial crisis; the 18-month period of the financial crisis; and a 156-month period following the financial crisis, during which the continuing effects of the value crisis accompanying the financial crisis are observed. The principle objective of the present study is to empirically measure the level of uncertainty concerning the value of the IDR against the USD and the effects of the uncertainty on the Shariah compliance of international commutative transactions during and following the financial crisis, taking the form of either spot exchanges or exchanges involving deferred payments, in relation to the prohibition against *gharar*. Premised upon purchasing power parity theory, the present study examines the exchange rate based upon the perceived local value of the two currencies, measured as the real exchange rate (RER) based upon inflation data for the two currencies; and the perceived value of the Indonesia Rupiah according to international financial markets, measured by the nominal exchange rate (NER) between the two currencies. The purchasing power parity between the NER and RER is then examined to determine a *gharar* threshold that determines whether the disparity between the two values constitutes a minor level of uncertainty, which is permissible under Shariah law, or excessive uncertainty, which is forbidden in commutative transactions under Shariah law. Based upon the *gharar* threshold determined, the conclusion and/or completion of international commutative transactions during and following the financial crisis (until the resolution of the value crisis) are deemed to include excessive uncertainty, raising serious doubts concerning the validity of such transactions under Shariah law.*

*Keywords: Gharar; fiat money; international trade; value crisis; Shariah compliance*

### ABSTRAK

*Krisis kewangan adalah aspek yang biasa dalam persekitaran ekonomi semasa. Kajian ini mengkaji kesan Krisis Kewangan Asia pada tahun 1997 terhadap nilai Rupiah Indonesia (IDR) berbanding Dolar AS Dollar (ASD) bagi tempoh 186 bulan, termasuk tempoh 12 bulan sebelum krisis kewangan bermula secara rasmi; tempoh 18 bulan semasa berlakunya krisis kewangan; dan tempoh 156 bulan selepas krisis kewangan, dalam tempoh yang mana kesan berterusan krisis nilai yang mengiringi krisis kewangan dikaji. Objektif utama kajian ini adalah untuk mengukur secara empirikal tahap ketidaktentuan nilai IDR berbanding ASD dan kesan ketidaktentuan tersebut terhadap pematuhan Shariah transaksi tukar ganti (komutatif) antarabangsa semasa dan selepas krisis kewangan, sama ada dalam bentuk pertukaran semasa atau pertukaran yang melibatkan bayaran tertunda, dari segi hubungannya dengan larangan terhadap *gharar*. Berlandaskan kepada teori kuasa beli pariti, kajian ini mengkaji kadar pertukaran berdasarkan nilai tempatan yang ditanggapi bagi kedua-dua mata wang, yang diukur dengan kadar pertukaran sebenar (RER) berdasarkan data inflasi bagi kedua-dua mata wang dan nilai Rupiah Indonesia yang ditanggapi mengikut pasaran kewangan antarabangsa, yang diukur oleh kadar pertukaran nominal (NER) antara kedua-dua mata wang. Kuasa beli pariti antara NER dengan RER seterusnya dikaji untuk menentukan ambang *gharar* yang menentukan sama ada perbezaan antara kedua-dua nilai berada pada tahap ketidaktentuan yang kecil yang dibenarkan mengikut undang-undang Shariah, atau ketidaktentuan yang berlebihan yang dilarang dalam transaksi komutatif mengikut undang-undang Shariah. Berdasarkan ambang *gharar* yang telah ditentukan, kesimpulan dan/atau sempurnanya transaksi komutatif antarabangsa semasa dan selepas krisis kewangan (sehingga krisis nilai selesai) disifatkan merangkumi ketidaktentuan yang berlebihan yang menimbulkan keraguan serius mengenai kesahihan transaksi sedemikian mengikut undang-undang Shariah.*

*Kata kunci: Gharar; wang fiat; perdagangan antarabangsa; krisis nilai; pematuhan Shariah*

## INTRODUCTION

Financial crises are an unfortunate reality in the contemporary economic environment that result from significant issues emerging in the domestic financial markets of one country that can result in spillover effects on a regional or global scale (Eichengreen & Portes 1987). Although the severity of financial crises varies, the frequency of such crises is a matter of concern. A study performed by the International Monetary Fund (IMF) in 1998 identified 158 separate currency crises that had occurred in 22 industrialized countries and 31 developing countries between 1975 and 1997 alone (IMF 1998). A recent example of such a crisis is the 2006 subprime crisis in the US which culminated in the global financial crisis of 2007 (UN 2009), which is regarded as the worst financial crisis since the Great Depression of the 1930s and 1940s (Karim, Mohd Kassim & Arip 2010). While the 2006 subprime crisis in the US had marked effects on most global financial institutions, Islamic banks and financial institutions remained relatively sheltered, but not completely immune, from the global spillover effects which culminated in the global financial crisis of 2007 (Suzuki 2013). The reason for the diminished effects of the 2007 global crisis on Islamic financial institutions arguably rests in the distinctions between conventional, or western-based, approaches to financial matters and Islamic approaches to financial matters.

Islamic approaches to issues of finance are premised upon principles dictated under *Shariah* law. The *Shariah* legal system, according to the four principal Sunni *madhab* (schools of Islamic jurisprudence), is premised upon rules derived from the text of the Qur'an; *sunnah* (traditions of the Prophet Muhammad (SAW) recorded in *ahadith* compiled by Islamic scholars); *qiyas* (analogies premised upon the rules and principles derived from the Qur'an and *sunnah*); and *ijma* (consensus among scholars concerning the application of rules and principles derived from the Qur'an and *sunnah*) (Kamali 2009). The specific body of Islamic norms and principles relevant to economic and financial transactions is referred to as *fiqh muamalat*, which is utilized to determine the *Shariah* compliance of contemporary commercial activities. The principal ambit of *fiqh muamalat* is to ensure that the rules and guidelines espoused by *Shariah* law are implemented during commutative transactions, or transactions involving an exchange of a subject for a countervalue, involving Islamic parties to establish and maintain an Islamic moral economy (Karim 2010).

The three principal cornerstones of *fiqh muamalat* are the prohibitions against *riba*, *gharar* and *maysir* (Hitti 2007; Karim 2010). While *riba* is commonly defined as 'interest' by many contemporary scholars, the prohibition extends to a much broader category of offenses that involve the unjustified enrichment of the benefits of a transaction (Uberoi & Khadem 2011) resulting in one party being obliged to pay an amount reflecting an excess of the nominal principal (Toutouchian 2009).

Contemporary explanations of the prohibition against *gharar* generally focus upon uncertainty and risk (e.g., Abdul-Rahman 2010; Zahraa & Mahmood 2002; Vogel & Hayes 1998). The prohibition against *maysir* is closely related to the prohibition against *gharar*, insofar as all instances of *maysir* constitute *gharar* (Iqbal 2009), but can be distinguished on the basis that *maysir* involves "intentional" participation in a risky transaction (Schoon 2009) that constitutes gambling (Stilt 2011; Vogel & Hayes 1998; Lewis 2010) or otherwise unjustified enrichment arising purely from chance (Lewis 2010). The rules and principles embodied under *fiqh muamalat* apply to all commercial transactions involving an Islamic party, irrespective of whether the transaction is local or international in nature.

The present study focuses upon the prohibition against *gharar* in relation to international commutative transactions concluded during periods of, and following, financial crisis. Issues concerning the value(s) of contemporary currencies when utilized in international commutative transactions are of particular interest in the present study, particularly in light of *Shariah* requirements concerning the ascertainable value of the subjects of a commutative transaction. The four principal objectives of the present study are to provide an empirical demonstration of uncertainty concerning the value of one fiat-based money against another during and following a financial crisis; to determine an empirical threshold of *gharar* relating to the uncertainty of value of one currency against another during and following a financial crisis; to determine the permissibility of international commutative transactions during a financial crisis and during the value crisis which continues after a financial crisis; and determine when the value crisis accompanying a financial crisis can be said to have resolved. The present study specifically examines the perceived local and international values of the Indonesian Rupiah (IDR) against the US Dollar (USD) during the periods prior to, of and following the 1997 Asian Financial Crisis (AFC 1997).

The remainder of the paper is structured as follows. The following section comprises a literature review that provides an overview of the AFC 1997; an overview of the distinctions between the monetary standards envisaged by *Shariah* texts and contemporary currencies; a deeper explanation of the relevance of prohibitions against *gharar*; and an explanation of the distinction between the present study and extant literature concerning *gharar*. The third section provides details concerning the data and methodology employed in the present study, which is followed by a discussion of the results and analysis in the fourth section. The final section provides the broader reaching conclusions of the present study; the implications of the findings; and provides suggestions concerning the direction of future research regarding the use of contemporary currencies in international commutative transactions involving a party from a jurisdiction experiencing a financial crisis or recovering from a period of financial crisis.

## LITERATURE REVIEW

The AFC 1997, which adversely affected 8 national economies in Asia, originated in Thailand. Although the official date of the beginning of the AFC 1997 is 2 July 1997 when the Thai Baht (THB) was allowed to float and depreciate, the actual crisis began in 1996 (Jao 2001). Goldstein (1998) posits that three distinct categories of causes exist for the onset of the AFC and its subsequent spread from Thailand to other countries in the region: issues in the financial sector; issues in the external sector; and contagion. The dominant issues in the financial sector that contributed the crisis include the extension of large amounts of credit; a substantial amount of non-performing loans; risky borrowing practices by banks and corporations, which included borrowing in foreign denominations to reduce borrowing costs; weaknesses in the supervision and regulation of the financial sector; a lack of transparency and disclosure quality; and the draining of international reserves by the Thai government to defend the value of the THB, only to face problems repaying short-term public debt later. The external sector problems that contributed to the AFC 1997 included a low quality of investment; the fact that real effective exchange rates indicated a deterioration in competitiveness while the real exchange rate was overvalued; the slowdown in exports in the region after 1996; the potential competitive advantage of China over other Asian economies; and overproduction in certain industries coupled with intense export growth. The element of contagion is described in light of two approaches: the ‘wake-up call hypothesis,’ which argues that investors saw what was occurring in Thailand and discovered many other countries in Asia suffered from similar issues in their respective financial and external sectors; and the ‘competitive dynamics of devaluation,’ which argues that countries in the region devalued their currencies to protect against deteriorating competitiveness with other countries in the region. While the first two categories explain the thematic issues common amongst the countries most adversely affected by the crisis, contagion explains the reason for the spread of the crisis to countries throughout Asia. Despite the suggestion of the IMF that Thailand take precautionary measures to protect against a potential financial crisis, the onset of the AFC in Thailand and subsequent spread to neighboring countries was largely unforeseen (Jao 2001). Indonesia was among seven other economies in the Asian region (i.e., Hong Kong, Singapore, Thailand, Malaysia, South Korea, the Philippines and Japan) that were adversely affected by the AFC; and among the three worst affected economies (i.e., Indonesia, South Korea and Thailand).

Not all financial crises are the same. Generally speaking, three principle types of crises are generally identified among authors: banking crises, public debt crises and currency crises (e.g., Dabrowski 2003; Goldstein & Wong 2005; Niemira & Saaty 2006; IMF 1998). Banking crises refer to actual or potential bank runs and failures that

result in the suspension of the convertibility of liabilities and/or government intervention. A public debt crisis arises when a government is no longer able to service its public debts (Dabrowski 2003), although the IMF categorizes such a crisis as a ‘foreign debt crisis,’ a categorization that also includes private debts (IMF 1998). Currency crises arise when the confidence in a given currency declines and the government can no longer defend the value of the currency with international reserves, resulting in speculative attacks on the monetary standard and the depreciation of the value of the currency. While Indonesia experienced all three types of crises during the AFC, the resulting effects of the currency crisis are of principal interest in the present study. However, the effects of the financial crisis must be understood in the context of the nature of contemporary currencies and the means by which they acquire value.

Traditional moneys, used virtually universally between communities and nations prior to the twentieth century, were commodity-based moneys (Menger 2009). Commodity-based moneys consisted of either commodity moneys minted from precious metals (e.g., gold, silver and copper) (Eachern 2008) or commodity-backed notes whose face value represented an amount of a precious metal that could be controverted, on demand, for the amount of specie indicated (Leysdon & Thrift 1997; Starr 2012). Commodity money fulfilled three basic functions: a medium of exchange; a unit of account; and a store of value (Islahi 1988). Commodity moneys could consist of any commodity considered by a community or nation to be a medium of exchange, but certain commodities would come to acquire universal value on the basis of durability, portability, divisibility, quality, opportunity cost and stability of value (Eachern 2008). Furthermore, precious metals came to be adopted virtually universally due to their utility, ornamental beauty, relative scarcity, geographic distribution and high market demand (Menger 2009). The transition from commodity money to commodity-backed money is argued to be related to the costs and high risk of fraud when merchants attempted to determine the value of different coins that may have been clipped or may have deteriorated in value; the risks and security needs associated with strong large amounts of coins and precious metals; and the weight of the commodity required to complete large transactions, particularly large distances (Jevons 2005). However, the use of moneys with a value supported by an underlying commodity or asset would end in the late twentieth century.

Both banks and governments came to understand the immense gains that could result from expanding a system of credit money, or money that was not backed by an underlying good or commodity other than the debt it represents (Moore 2003), but realized that sufficient reserves needed to be maintained to guarantee public confidence in the currency (Bagus 2010). The evolution from commodity-backed money to fiat money reflects this ambit. First, European government began to shift away from a gold standard, whereby the currency issued by the governments through their central banks

was convertible for the specie it represented. At the beginning of World War I, the convertibility of currency for specie was suspended in order to raise money for the war effort in many European countries. When a gold system was reintroduced, it was a gold bullion standard, which removed gold coins from circulation and virtually eliminated the ability of most people to redeem notes for specie due to the amount of currency required to be redeemed for bullion. Following World War II, the Bretton Woods system was introduced, whereby only governments and central banks could redeem notes for gold and their currency was valued against the US dollar, which remained fixed in value to a set ratio of gold. The United States of America, however, would eventually suspend redemption and convertibility of its currency into gold in 1971, joining with virtually every other government in existence in its use of fiat money (Bagus 2010). Having completely separated currency from objective values associated with commodities, banks and governments could produce a virtually limitless supply of currency and credit money, with the banks making significant gains through loans and investment (Moore 2003), while the government reaped extensive gains from inflation, taxation and other revenues associated with its monopoly over the printing of currency (Hülsmann 2008).

The transition from commodity-based moneys to fiat-based moneys also resulted in a transition in the manner in which 'money' attained its value. Commodity moneys were valued according to the value of the underlying commodity, a value which was determined, to a large extent, by economic forces (i.e., supply and demand). Fiat-based moneys, on the other hand, attain their respective values from a variety of factors. The domestic value (i.e., local value) of fiat-based monetary standard is attained from a 'value convention,' which is based upon local and national practices relating to exchanges; culture; customs; and tradition. The perceived value of the money therefore remains intact as long as the government and financial institutions are able to maintain the credibility, credence, reputation, confidence, social recognition and 'brand-name value' of the monetary standard in the eyes of the public (Bonus 2001). As a result, two principal market factors affect the domestic inflation (i.e., decrease in value) of fiat-based moneys: cost-push inflation, which results from increases in wages and raw materials that force prices up; and demand-pull inflation, which results from rapid economic growth that leads to consumer demand outstripping supply and causes prices to increase. However, political factors also cause inflation in the value of fiat-based money include governmental and central bank policies that result in monetary supply fluctuation due to the expansion of the amount of money in circulation; and increases in tax rates. Furthermore, the fear of an economic downturn can result in members of the general population attempting to protect their individual living standards (Welch & Welch 2010), which is a constant concern due to the fact that the existence of inflation causes varying

degrees of uncertainty regarding the value of domestic currencies (Wannacott & Wannacott 1990).

Meanwhile, contemporary fiat-based moneys also attain their respective values for purposes of international exchanges due to a variety of factors. The contemporary nominal exchange rate (NER), or the rate of exchange of currency A for an equivalent value of currency B, is primarily defined in relation to the supply and demand for a specific currency in international markets, which is affected by numerous economic, political and psychological factors (Macesich 1996). Economic factors include interest rates and foreign investment in the country in question; balance of payments, which applies to trade flows between two countries; domestic stock exchange activity; and the demand for the exports of the country in question. Political factors include government policy and central bank intervention affecting currency value; and political stability (Whittington & Delaney 2012). Finally, psychological factors affecting currency exchange rates include the perceived credibility of statements concerning intervention and inflation rates of the government and central bank; and expectations regarding the future value of a given monetary standard or future trade performance (Gonçalves 2008). Due to the numerous factors involved in the valuation of fiat-based moneys within international markets (i.e., international value), the exchange rate between two different fiat-based moneys changes constantly throughout the course of a day.

While the Shariah compliant nature of contemporary fiat-based moneys is dubious among certain scholars (e.g., Rab & Anjum 2011; Meera & Larbani 2009), historical practices within Islamic civilizations appear to support the use of fiat-based moneys to a certain degree. Islamic civilizations and societies have typically used gold and silver coinage (i.e., *dinar* and *dirham*, respectively) as a medium of exchange. However, token moneys, or moneys whose value is established by the government of issuing authority rather (Siegrfried 2001) have also existed alongside commodity moneys within Islamic economic systems for use as mediums of exchange. While the value of token moneys exceeded the actual value of the material of which such monies consisted (Mukherjee 2002), token moneys, such as *fulus* and *maghshush*, have been historically utilized within Islamic societies (Noonan 1974). However, token monies were only used for small local transactions; and intended to be used to provide change for purchases made with *dinar* or *dirham*.

In order to understand the relationship between the prohibition against *gharar* and the value of fiat-based moneys, the underlying prohibition itself must be understood. *Gharar* is not defined or explained in precise terms in *ahadith* (Vogel & Hayes 1998) and is not expressly mentioned in the Qur'an (Al-Saati 2003). Despite the absence of a precise definition in the *Qur'an* and *sunnah*, most contemporary definitions and explanations generally focus upon undue risk and uncertainty arising in relation to transactions (Abdul-Rahman 2010; Zahraa & Mahmor

2002; Vogel & Hayes 1998: 64; Farook & Shikoh 2011), irrespective of whether the uncertainty or deception was intentional or unintentional by either or both parties to a transaction (El-Gamal 2006). Despite the existence of nuances regarding the application of the prohibition of *gharar* when determining whether a transaction is *Shariah* compliant among the four Sunni *madhab*, Al-Dhareer (1997) establishes four universal conditions for a transaction to be invalidated: the *gharar* must be major; the contract effected must be a commutative financial contract; *gharar* must affect the principal components of the contract, such as price and object of sale; and no need met by *gharar* exists that cannot be met otherwise.

The prohibition of *gharar* is understood by contemporary Islamic jurists and scholars to be based upon a cost-benefit analysis (El-Gamal 2001). Specific instances of *gharar* that are expressly forbidden include lack of knowledge concerning the type of price or subject matter; the characteristics of the price or subject matter; or the quantum of the price or quantity of the subject matter (Zahraa & Mahmor 2002). Although the term ‘price’ is typically understood as being reflective of the value of the subject matter in a specific amount of a specific currency for the purposes of a commercial exchange, *Shariah* prohibitions against *riba* provide further explanation of the application of *gharar* to matters concerning value. As noted above, prohibitions against *riba* forbid unjustified benefits arising from a transaction, which includes the increase, addition or growth of benefits (Chapra 2008). Furthermore, the prohibition against *riba al-fadl*, a specific category of *riba*, requires that the “two scales of the balance carry the same value of goods” (Chapra 2008: 52), a violation of which would be tantamount to obliging one party to pay an amount that reflects an excess of the principal (Toutouchian 2009). The *Shariah* approach to commutative transactions reflects secular economic thought concerning exchanges, which recognize that no essential theoretical difference exists between a system of direct exchanges (i.e., barter) and indirect exchanges (i.e., exchanges involving the use of a medium of exchange) (Schumpeter 1994). As a result, the position of price and subject matter are not absolute, but relative: the value/price of Item A can be stated to be 100 units of a specific monetary unit, while the value/price of 100 units of a specific monetary unit can be stated to be Item A. As a result, prohibitions against *gharar* effectively forbid transactions involving uncertainty regarding the value of the goods, services or commodities; or the value of the monetary units used as countervalues.

Existing literature concerning *gharar* can be divided into two categories, which are referred to as ‘dimensions’ by Suzuki (2013): uncertainty or ambiguity regarding provisions in a contract or other agreement; and uncertainty regarding the object of the contract. Instances raised that are argued to constitute *gharar* in the provisions of a contract or other agreement include ambiguity or lack of specificity concerning price, genus, quality and quantity in a contract (Rudnyckyj 2013); multiple pricing provisions

within a single deferred payment sale (Mohd Yatim 2009); networking capital; adjustments and clawback provisions in commutative contracts (Moghul 2011); and lack of knowledge regarding the subject matter of a contract and its implications (Ahmad & Ahmad 2009). Instances raised that are argued to constitute *gharar* in the object of a contract include intentionally deceiving a buyer regarding the condition of a house (Schoon 2008); incomplete information about the objects of an exchange (Azid & Asutay 2007); ambiguity regarding the characteristics of an asset (Kordvani 2009); the use of options for hedging purposes purely to acquire profit (Smolarski, Schaper & Tahir 2006); and conventional insurance (El-Gamal 2007; Cerimagic 2010).

Extant literature also examines whether or not contemporary fiat-based moneys are *Shariah* compliant due to their nature. For example, Rab and Anjum (2011) examine the issue of freely floating fiat money (FFFM) in light of the *Shariah* prohibitions against *gharar* and conclude that not only the use of fiat money in commutative contracts is forbidden, but the manipulation of the value of fiat money and, therefore, the nature of fiat money itself violate *Shariah* prohibitions against *gharar* on the basis that fiat money possesses “no intrinsic value, and is variable, indefinite and undefined (Rab & Anjum 2011: 195). Similarly, Meera and Larbani (2009) examine the nature of credit money (bank money) within contemporary fiat-based monetary systems and the creation of such forms of fiat-based money due to fractional reserve banking practices. Meera and Larbani (2009) conclude that such forms of fiat-based money are *riba*-based and contribute to inflation, which is part of the issue of ‘manipulation’ referred to by Rab and Anjum (2011).

Additionally, the issue of whether the inherent *gharar* involved in a transaction violates *Shariah* prohibitions concerning uncertainty and ambiguity is important. Although consensus between the four Sunni *madhab* exists regarding the general features and prohibitions associated with *gharar* in transactions, considerable disagreement exists between scholars of the four Sunni *madhab* concerning what level of uncertainty may exist in a transaction before the transaction is rendered invalid under *Shari’ah* (Vogel & Hayes 1998: 64; Al-Saati 2003; El-Gamal 2001). A minor level of uncertainty, referred to as *gharar yasir*, is deemed acceptable by many Islamic scholars, arguably due to the fact that *Shariah* law inherently recognizes that all commutative transactions involve elements of risk and uncertainty due to the general nature of market and business ventures (Witbrodt & Shapiee 2013). However, *gharar fahish*, which refers to exorbitant levels of *gharar* that cannot be considered trivial (Buang 2000), are generally accepted to constitute violations of *fiqh muamalat*. Although most scholars that examine issues concerning *gharar* distinguish between minor and major levels of uncertainty in their analyses of the *Shariah* compliance of economic and financial activities and transactions, the threshold for distinguishing between major and minor remains undefined, ambiguous

and subjective. The inherent lack of definitiveness is paradoxical considering the context and content of the *Shariah* prohibition, but can be partially explained by the qualitative nature of existing literature concerning the existence of *gharar* in transactions.

While financial crises undoubtedly have an impact on local commutative transactions, particularly in relation to uncertainty of value, the present study restricts the scope of the examination to international commutative transactions for two principal reasons. First, as noted above, evidence exists that fiat-based moneys have been used for purposes of local exchanges within Islamic communities and societies, but not for purposes of exchanges between parties from different communities or nations (i.e., international exchanges). Second, although the moneys used in local transactions are fiat-based, the money utilized is 'universal' for purposes of exchanges within a given jurisdiction and does not require a rate of exchange for the purpose of determining value.

The present study specifically addresses issues concerning the use of fiat money as a countervalue in international commutative transactions during periods of, and following, financial crisis in relation to *Shariah* prohibitions against *gharar* and can be distinguished from existing literature on grounds. First, while existing literature concerning the prohibition against *gharar* is qualitative in nature, the present study provides an empirical and, therefore, quantitative analysis of the uncertainty of value of fiat-based moneys during periods of financial crisis. Secondly, the examination and analyses performed during the present study examine the effects of the use of fiat-based moneys in specific types of transactions (i.e., spot and deferred international commutative transactions) rather than examining whether fiat-based moneys are, by nature, *Shariah* compliant. Thirdly, in measuring the amount of uncertainty relating to the value of fiat-based moneys, the present study presents a means of empirically determining whether the amount of uncertainty regarding the value of a fiat-based money during the value crisis that accompanies, and continues after, financial crises is trivial and minor (*gharar yasir*) or excessive and major (*gharar fahish*). The term 'value crisis' is used in the present study to denote the period of time during which a financial crisis affects the value of money on the basis of the importance of public confidence in a given fiat-based currency, particularly in regards to the link between confidence and the severity of, and recovery from, financial crises generally (e.g., Kawai & Pomerleano 2011; Kahler 2000; Financial Crisis Inquiry Commission 2011; Claessens et al. 2010; Glick 1999).

## METHODOLOGY AND DATA

The present study employs a framework premised upon purchasing power parity (PPP) theory, which is premised upon an internationalized version of the law of one price. The law of one price effectively states that identical goods

in two countries have the same price when expressed in terms that reflect the ratio of difference between the two countries (Chinn 1999). As a result, PPP is typically expressed as follows:

$$PPP = \left( \frac{\text{Cost of good A in currency X}}{\text{Cost of good A in currency Y}} \right) \quad (1)$$

PPP measures the value of one currency against the value of another currency in order to estimate the adjustment required to accurately reflect the purchasing power of one currency against another. The present study utilizes the monthly changes in the consumer price indices (CPI) to measure the change in price level of the countries examined in order to account for the changes in the perceived local values of the currencies examined. Effectively, the PPP is used to measure the change in value of one currency against another by inherently contextualizing the currency of each country examined as a 'good' and examining the changes in the relative value of the two currencies over a period of time, which is consistent with existing measures of the real exchange rate (RER) in other studies examining PPP (e.g., Chinn 1999). Second, PPP is utilized in the present study to gauge the deviation from equilibrium that occurs between the values of the IDR against the USD measured according to the reported NER and the RER during the period of study. For the purposes of the present study, the international commutative transactions considered consist of those transactions involving the payment of a price in either USD or IDR between a party based in Indonesia and a party based in the US.

A PPP-based examination requires two sets of data. First, CPI data concerning the price levels in Indonesia and the US is required in order to gauge a real exchange rate (RER). Second, information concerning the nominal exchange rate (NER) between the currencies of the two countries, which reflects the amount of units of currency *A* required to purchase a unit of currency *B*, is required. The two sets of data are analyzed in relation to the primary argument put forward according to PPP theory: differences in the RER and NER should dissipate over time and the NER and the RER between the countries examined will return to a constant equilibrium (Carlsson, Lyhagen & Österholm 2007). The numerical value of equilibrium according to PPP is 1, with any other figure representing a deviation from equilibrium. While short term examinations of the equilibrium predicted by PPP theory indicate that the equilibrium does not hold in the short-run, long term examinations indicate that the equilibrium predicted holds in the long-run (Bayoumi & MacDonald 1998). The objective of the present study is to determine the changes in value of the IDR resulting from the AFC 1997 by comparing the perceived local value against the perceived international value in order to determine a *gharar* threshold based upon the 12-month period prior to the crisis; and determine when the value crisis accompanying the AFC 1997 resolves (i.e., when the relative values of the RER and NER return to equilibrium).

Because the present study seeks to examine the effects of financial crisis on the value of the IDR during AFC 1997 and following the AFC 1997, three distinct time periods are examined. The first time period examined is the 12 month period prior to the AFC 1997 in order to determine whether or not equilibrium exists between RER and NER prior to the AFC 1997; and formulate a *gharar* threshold based upon the PPP. As noted above, the financial crisis examined is considered to have formally started on 2 July 1997. Therefore, 1 July 1996 is selected as the date of the beginning of the first period which ends on 1 July 1997. The second period examined consists of the period during the AFC 1997, which is typically described as lasting from 1997 until 1998 (e.g., Lai 2012). The second period therefore extends from 2 July 1997 until 31 December 1998. The third period examined begins 1 January 1999 and extends until the period of time at which the RER and the NER begin to show signs of regaining an equilibrium similar to that prior to the crisis in order to determine the length of the value crisis that resulted from the AFC 1997. As a result, the period examined in the present study is 15 years and 6 months.

#### PERCEIVED LOCAL VALUE

The perceived local values of the IDR and USD are calculated based upon the monthly inflation/deflation rates reported in Indonesia and the US, which consist of the figures reported by the Badan Pusat Statistik (or Statistics Indonesia) and the Department of Labor Statistics, respectively. Inflation (deflation) rates are indicative of the decrease (increase) of the perceived value of a currency utilized as a medium of exchange within a given country and are perceived to be indicative of the local value of the currency for the purposes of the present study. While other price indices could potentially be used for the calculation of local value (e.g., producer price index (PPI) and gross domestic product (GDP) deflator), Chinn (1999) argues that CPI figures may provide a more consistent measure of price levels and RER.

Monthly CPI data reflects the inflationary/deflationary changes during the month itself. The present study includes 187 observations of monthly inflation data derived from the CPI for each currency examined. A total of 374 observations are utilized for the purpose of determining the changes in a synthesized rate of exchange between the IDR and the USD based upon the changes in the local value of each currency due to the level of inflation/deflation reported for each country during each month of the study. Since the period examined commences on 1 July 1996, the monthly CPI data for June 1996 is utilized as a base price level to determine the cumulative effects of the monthly rates of inflation/deflation on the local values of the IDR and USD during the period examined; and is assigned a value of 1. The synthesized rate of inflation ( $InfRSYN_{CME}$ ), which reflects the purchasing power parity exchange rate between the IDR and the USD, is then calculated to account for the varying rates of inflation/deflation experienced by the IDR and USD during a given month as follows:

$$InfRSYN_{CME} = \left( \frac{MInfRIND_{CME} + 1}{MInfRUS_{CME} + 1} \right) - 1 \quad (2)$$

where  $MInfRIND_{CME}$  represents the monthly rate of inflation reported for Indonesia during the current month examined; and  $MInfRUS_{CME}$  represents the monthly rate of inflation for the US during the current month examined. The synthesized rate of inflation for each month represents the respective increase or decrease in strength of the IDR against the USD over the course of the month examined if the rate of exchange was based upon the increase/decrease of value arising from deflation/inflation of the respective currencies during the month examined.

The cumulative effect of inflation on the synthesized rate of inflation for each month ( $CumInfRSYN_{CME}$ ) during the period of study is then calculated for the subsequent 180 months as follows:

$$CumInfRSYN_{CME} = [(CumInfRSYN_{PM} + 1) (InfRSYN_{CME} + 1)] \quad (3)$$

where  $CumInfRSYN_{PM}$  represents the cumulative effects of inflation during the period of study on the synthesized rate of exchange based upon the local values of the IDR and USD at the end of the month previous to the current month examined; and  $InfRSYN_{CME}$  represents the synthesized rate of inflation between the IDR and the USD during the current month examined.

#### PERCEIVED INTERNATIONAL VALUE

In order to analyze the NER for the period examined, a complete compilation of historic exchange rates for the period examined are required. The rates utilized in the present study were obtained from the GoCurrency.com Currency Converter and Exchange Rates website ([www.gocurrency.com](http://www.gocurrency.com)). The period examination analyzes data extending over a 15-year and 6 month period, resulting in 5,663 observations of daily reported exchange rates (i.e., NER) being included in the present study. The reported NER for 30 June 1996 is selected as the base rate of exchange (i.e., IDR2326.25 : USD1) in order to provide a means to compare the changes in value and the rates appreciation/deflation and depreciation/inflation between the local exchange valuation (RER) and the international exchange valuation (NER) of the two currencies examined.

#### COMPARISONS BETWEEN THE NOMINAL EXCHANGE RATE (NER) AND THE REAL EXCHANGE RATE (RER)

Before a comparison between the NER observations of the rate of exchange between the IDR and the USD (i.e., IDR:USD) can be performed, further calculations must be performed in relation to the synthesized rate of exchange to provide an equal number of observations of RER in relation to NER. For the purposes of the present study, the synthesized rate of inflation for each month is assumed to reflect inflationary/deflationary effects between the last day of the previous month and the first day of the

month being examined. Furthermore, the inflation rate is assumed to be constant throughout the course of the month. The two assumptions allow for the calculation of a synthesized ratio of exchange for each day during the period examined. The calculation of the daily RER will be based upon the synthesized ratio of exchange, which reflects the rate of exchange that would exist if the rate reflected the changes in the local values of two currencies. The calculation of the daily synthesized ratio of exchange ( $SynRE_{CDE}$ ) is performed as follows:

$$SynRE_{CDE} = \left[ \left( \frac{CumInfRSYN_{CME} - CumInfRSYN_{PM}}{\#Days_{CME}} \right) \times Date \right] + CumInfRSYN_{PM} \quad (4)$$

where  $\#Days_{CME}$  represents the number of days in the current month examined;  $Date$  represents the number in the month of the current day examined; and all other variables are as defined previously. The resulting figures provide a basis for four different comparative analyses of the approximated RER against the reported NER for each day during the period of study.

First, the RER for each day is calculated and compared against the NER for each day during the period of study. The synthesized ratio of exchange for a particular day is converted into an RER ( $RER_{CDE}$ ) as follows:

$$RER_{CDE} = (SynRE_{CDE} + 1) \times ExcR_{Base} \quad (5)$$

where  $ExcR_{Base}$  represents the base exchange rate between the IDR and the USD (i.e., IDR2326.25 : USD1); and all other variables are as defined previously. The conversion of the synthesized ratio of exchange into an RER allows for a direct comparative analysis of the number of units of IDR required to purchase 1 USD at any point during the period of study.

The second comparative analysis performed involves measuring the rate of depreciation of the NER and the RER for each day during the period of study. The measurement of the rate of depreciation of the NER ( $DepNER_{CDE}$ ) is calculated as follows:

$$DepNER_{CDE} = \left( \frac{NER_{CDE}}{ExcR_{Base}} \right) - 1 \quad (6)$$

where  $RNER_{CDE}$  represents the reported NER on a given day; and all other variables are as previously defined. Meanwhile, the value of  $SynRE_{CDE}$  provides the rate of depreciation of the RER. Due to the existence of a period of financial crisis during the period of study, the results of each calculation will generally consist of positive integers that indicate a depreciation (decrease) in the value of the IDR against the USD, while negative integers will reflect an appreciation (increase) in the value of the IDR against the USD.

The third comparative analysis performed involves measuring the percentile-based change in value of the NER and the RER, respectively, for each day. The measurements

of the percentile-based change in value for the NER and the RER for each day of the period of study are performed as follows:

$$\left( \frac{ExcR_{Base}}{NER_{CDE}} \right) - 1; \text{ and } \left( \frac{ExcR_{Base}}{RER_{CDE}} \right) - 1 \quad (7)$$

where all variables are as defined previously. A percentile-based increase in the value of the IDR against the USD is indicated if a positive integer is found; and a percentile-based decrease in the value of the IDR against the USD is indicated if a negative integer is found.

The fourth comparative analysis measures the purchasing power parity between the NER and the RER for each day during the period of study. The purchasing power parity ( $PPP$ ) between the NER and RER for each day during the period of study is calculated as follows:

$$PPP = \frac{SynRE_{CDE} + 1}{DepNER_{CDE} + 1} \quad (8)$$

where all variables are as defined previously. A value of 1 indicates the existence of equilibrium between the RER and the NER. A value above 1 indicates a deviation from equilibrium where the RER is overvalued in relation to the NER. Conversely, a value below 1 indicates a deviation from equilibrium where the RER is undervalued in relation to the NER.

## RESULTS AND ANALYSIS

The results concerning the comparative analysis of IDR-based exchange rates based upon the NER and the RER (see Figure 1) reveal the severity of the difference between the NER and the RER for the majority of the period examined. Prior to the AFC 1997, the exchange rates according to the NER and the RER are relatively homogenous, varying little until the formal onset of the AFC 1997 on 2 July 1997. However, between July 1997 and December 1998 (i.e., the period of the AFC 1997), significant differences appear in the value of the IDR against the USD between the NER and the RER. The RER, which reflects the perceived local values of the IDR and the USD, does not reflect a weakening of the IDR against the USD greater than IDR4469.09 to USD 1 during the AFC 1997, which occurs on 31 December 1998. However, the exchange rate based upon the NER indicates that the IDR weakened against the USD to a maximum of IDR16,000 to USD 1, which is reported on 17 June 1998. Furthermore, during the period following the AFC 1997, the two exchange rates do not return to equilibrium until 10 October 2010, which is quickly lost and is not regained until 27 September 2011. The results indicate that a significant disparity exists between the two rates for period of 13 years following the onset of the AFC 1997.

The second comparative analysis examines the rates of depreciation of the IDR in light of the NER and the RER (see Figure 2). Based upon the NER, the highest depreciation rate of the value of the IDR against the USD

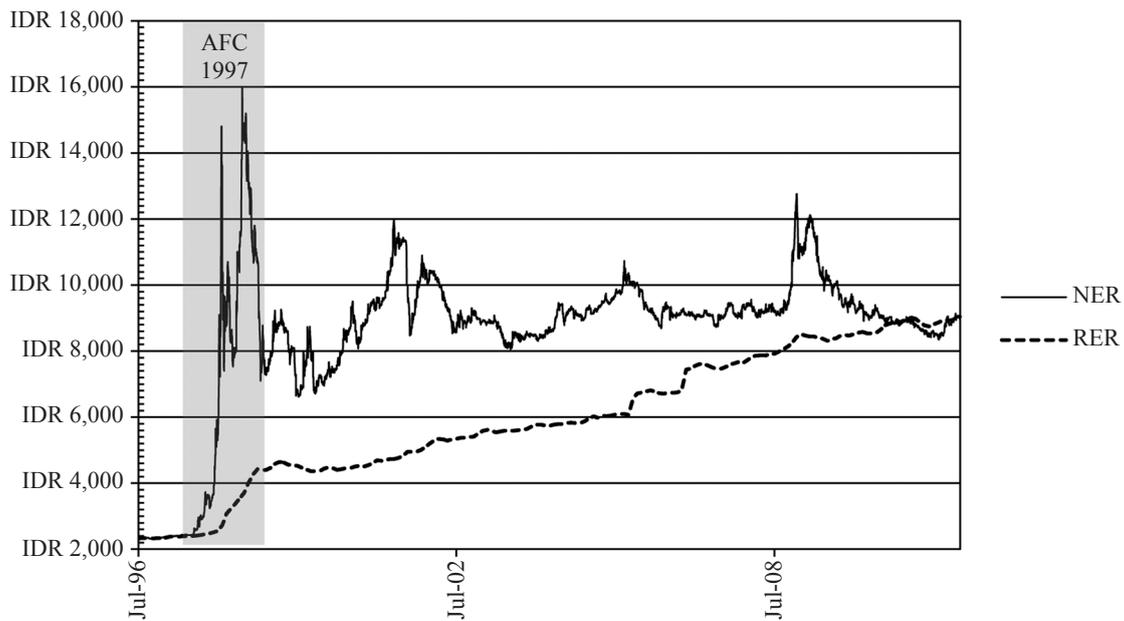


FIGURE 1. NER and RER, 1 July 1996-31 December 2011

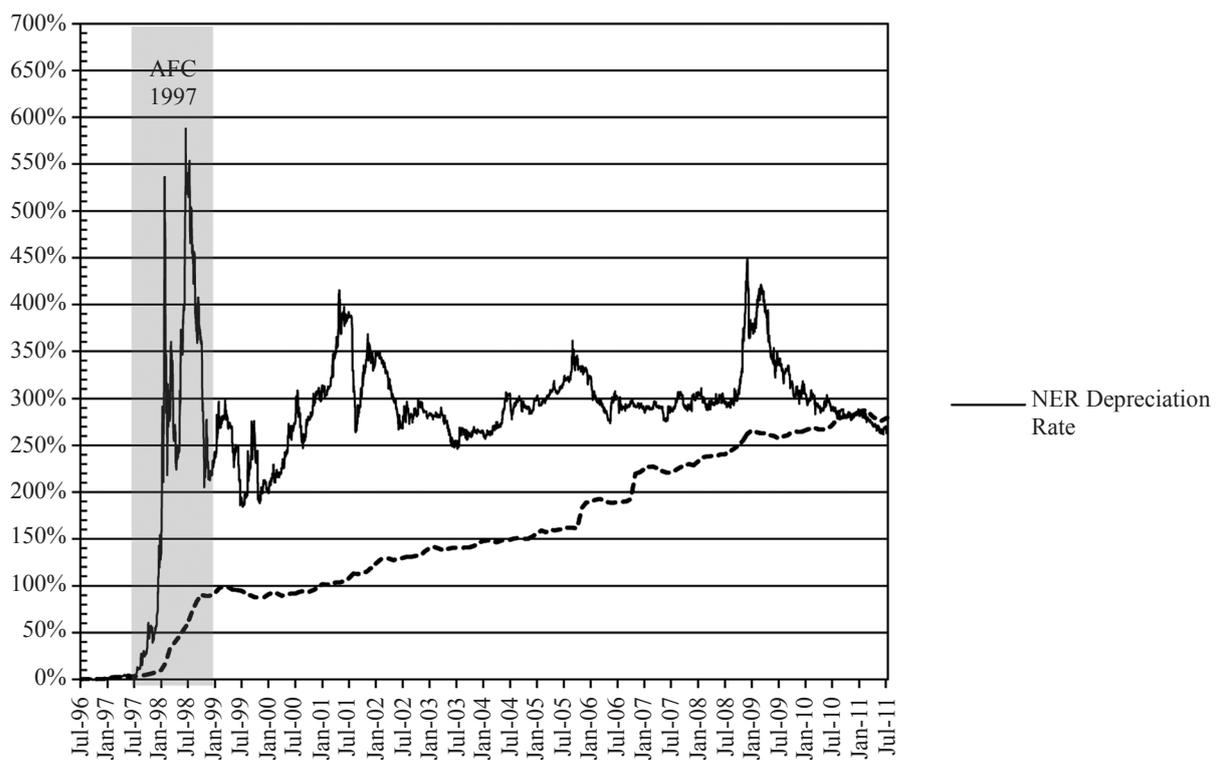


FIGURE 2. NER and RER depreciation rates, 1 July 1996 – 31 December 2011

prior to the AFC 1997, using 30 June 1996 as a base rate, is 5.0618% on 28 May 1997, with the depreciation rate being measured as 4.5459% on 1 July 1997. Meanwhile, based upon the RER, the highest depreciation rate of the IDR against the USD prior to the AFC 1997 is 3.0658% on 31 May 1997, with the depreciation rate being measured as 2.9133% on 1 July 1997. The range of the disparity between the depreciation rates according to the RER and the NER does not exceed 2.0908%, which occurs on 25

April 1997, during the period prior to the AFC 1997. While the depreciation rates indicated by the RER measure and the NER measure vary slightly before the AFC 1997, the disparity between the two becomes exponential during the AFC 1997. Two significant spikes in the depreciation rate of the IDR against the USD based upon the NER occur during the AFC 1997, resulting in maximum depreciation rates of 536.2171% on 23 January 1998; and 587.8023% on 17 June 1998. Meanwhile, the depreciation rate of the IDR

against the USD based upon the RER only reaches as high as 92.1157% on 31 December 1998. Following the AFC 1997, four further significant spikes in the depreciation rate of the IDR against the USD based upon the NER occur: 26 April 2001, reaching 414.9919%; 6 November 2001, reaching 368.1784%; 30 August 2005, reaching 361.1714%; and 1 December 2008, reaching 448.3121%. Meanwhile, for the exact same dates, the depreciation rate of the IDR against the USD based upon the RER measures is 103.4832%; 115.9929%; 162.0536%; and 262.3084%, respectively. The significant disparity in the depreciation rate measured by the two exchange rates begins to resolve in late 2010.

The results of the third comparative analysis, depicted in Figure 3, demonstrate the change in the value of the IDR against the USD as measured according to the NER and the RER. The constant effects of domestic inflation on the local values of the IDR and the USD result in the decrease of the value of the IDR against the USD from the base value according to the RER measurement, while the value of the IDR against the USD as measured by the NER result from the valuation of the two currencies within international financial markets. Prior to the AFC 1997, the value of the IDR against the USD remains relatively consistent until March 1997, at which point the decrease in value of the IDR against the USD is more marked when measured according to the NER. Arguably, this marks the beginning of the value crisis associated with the AFC 1997 in relation to the IDR. Despite the indication of wavering confidence in the value of the IDR against the USD according to the NER and RER measurements, the decrease in value is measured on 1 July 1997 as 4.3483% and 2.8307%, respectively. The range of

disparity between change in value of the IDR against the USD based upon NER and RER does not exceed 1.9452% of the base value of the IDR against the USD, which occurs on 25 April 1997, prior to the AFC 1997. Following the official beginning of the AFC 1997, the value of the IDR against the USD plummets, but an obvious disparity is demonstrated between the two measures. According the decrease in value measured according to the NER, the value of the IDR decreases by 85.4609% by 17 June 1998 and reflects a decrease of 70.5557% against the base rate of exchange on 31 December 1998. Meanwhile, the value of the IDR against the USD decreases relatively slower when measured according to the RER, which only indicates a decrease in value of 47.948% according to the perceived local values of the two currencies by 31 December 1998. Following the AFC 1997, the decrease in value of the IDR against the USD as measured according to the NER remains greater than 70% for the remainder of the period of study with the exception of one period of appreciation between April 1999 and April 2000, when the value of the IDR against the USD increased to as high as 64.8337% below the base exchange rate value (which occurred on 12 July 1999). The decrease in value of the IDR against the USD measured according to the RER, on the other hand, does not fall to 70% of the base value until 6 January 2008. The value of the IDR against the USD according to both measures appears to stabilize after 2010, with the decrease in value as measured according to the NER remaining between 72% and 75% of the base exchange rate value from 4 March 2010 onwards; and the decrease in value according to the RER remaining between 73% and 75% of the base exchange rate value from 22 June 2010 onwards.

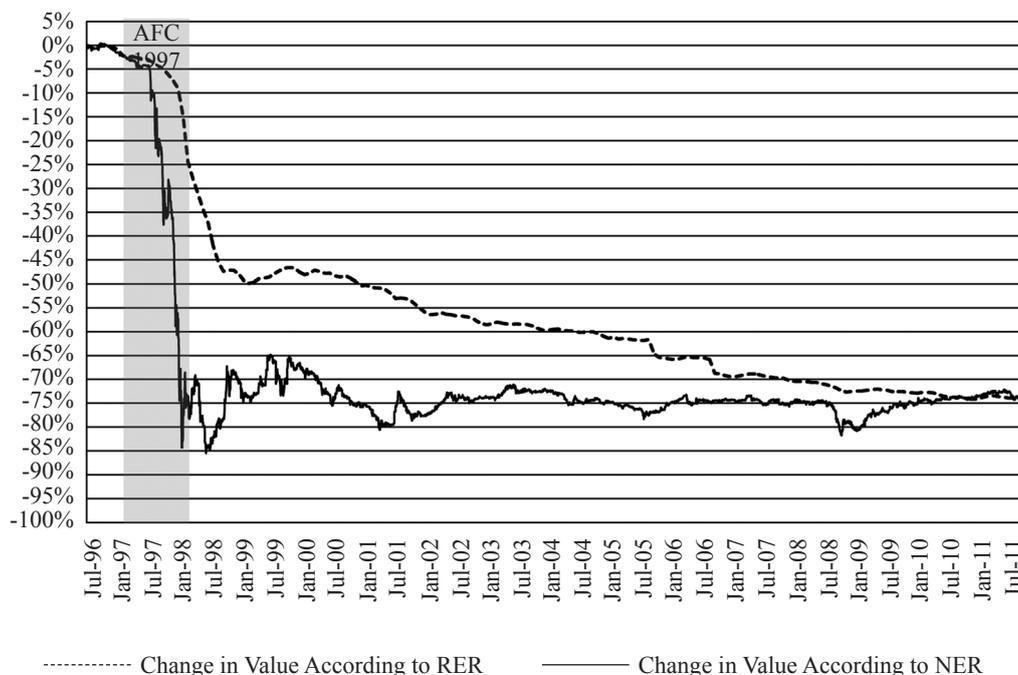


FIGURE 3. Comparison of the change in the value of the IDR against the USD according to the RER and the NER, 1 July 1996 – 31 December 2011

The fourth and final comparative analysis performed provides the PPP measure of the value of the IDR against the USD according to the NER against the value of the IDR against the value of the USD according to the RER, as depicted in Figure 4. According to the PPP values, prior to the AFC 1997, the maximum extent to which the RER is overvalued in relation to the NER occurs on 21 September 1996, with a value of 1.0053, while the maximum extent to which the RER is undervalued in relation to the NER occurs on 25 April 1997, with a value of 0.9800. During the AFC 1997, the RER is consistently undervalued in relation to the NER according to the PPP value, ranging between 0.9838 on 2 July 1997 and 0.1817 on 23 January 1998

at the height of the financial crisis. Following the end of the AFC 1997, during the continuing value crisis, the PPP values continue to fluctuate. On 1 January 1999, the PPP value is 0.5662, reducing as low as 0.3951 on 26 April 2001, before finally returning to equilibrium (i.e., a value of 1) between 25 and 26 September 2010 for the first time since 16 February 1997. However, equilibrium is only intermittently maintained between 26 September 2010 and 3 January 2011 before the RER becomes overvalued in relation to the NER until 27 September 2011, at which point the PPP values suggest intermittent equilibrium again for the remainder of the period of study.

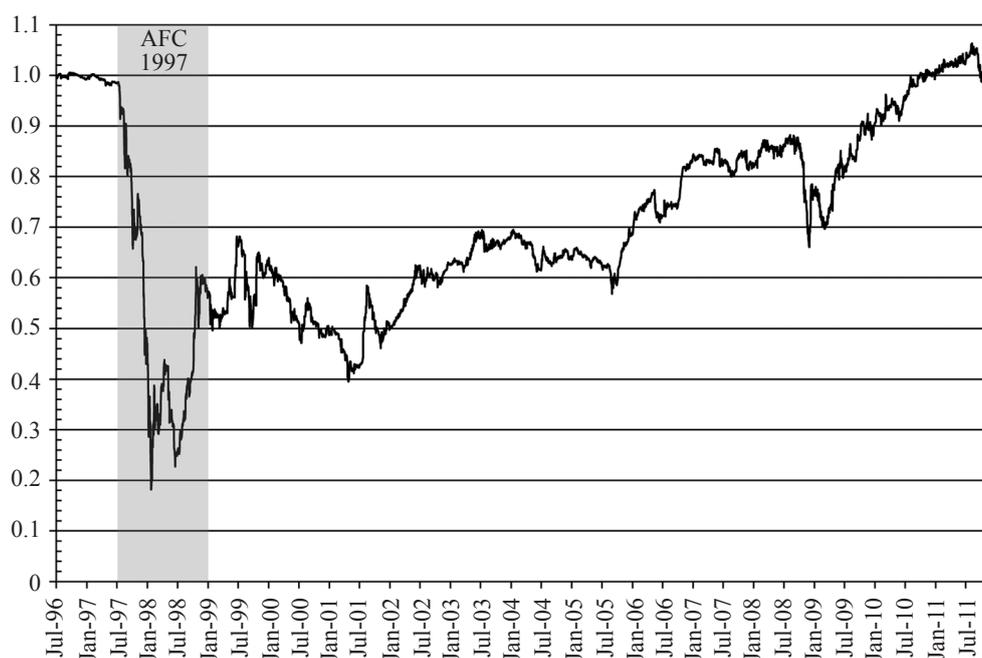


FIGURE 4. Purchasing power parity between RER and NER, 1 July 1996 – 31 December 2011

#### ANALYSIS

The results demonstrate that the effects of the AFC 1997, being initially felt between March 1997 and May 1997, result in a significant value crisis. Of particular interest in the present study are the variations between the NER, which is based upon the perceived increase/decrease in value of the IDR against the USD within international financial markets, and the RER, which is based on the perceived increase/decrease in the local value of the IDR and USD in their respective domestic markets. Three potential explanations exist regarding the disparity between the RER and the NER. First, the RER is premised upon the CPI figures released by the governments of the US and Indonesia, which could be erroneous. Although providing erroneous information may not be intentional, considerable debates exists concerning the most accurate means by which to measure the purchasing power of a money within a given economy (e.g., Baker 1998; International Labour Organization et al. 2009). Second, the NER, which reflects the international market valuation of one currency against

another, may be influenced by speculative attacks on a given currency, particularly prior to, during or following periods of financial crisis (e.g., Mishkin 2003; Eppstein & Hubbard 2013); or more detrimentally affected by sudden changes in other factors that affect the valuation of a currency within international financial markets, particularly considering the NER changes throughout the course of a day and is not based upon monthly calculations as in the case of CPIS. However, the position taken in the present study is that the disparity between the RER and the NER during the AFC 1997 regarding the value of the IDR against the USD is the result of a disparity between the levels of confidence in the domestic markets of the US and Indonesia; and international financial markets. As such, neither the RER nor the NER are considered to be erroneous, but indicate the lower and upper thresholds of the value of the IDR against the USD. Therefore, rather than perceiving either of the two rates of exchange to be an absolute rate of exchange, the disparity between the RER and the NER represent a range of potential values of the IDR against the USD.

The results generally depict a period of relative consistency between the NER and the RER until March 1997 (if using the change of the value of the IDR against the USD as the indicator of the beginning of the effects of the AFC 1997); April 1997 (if using the difference between the number of units of IDR required to purchase USD1 according to the NER or the RER); or May 1997 (if using the rate of depreciation as the indicator of the beginning of the effects of the AFC 1997). However, the PPP values for the period prior to the AFC 1997 are of considerable interest, particularly since the values demonstrate the fluctuation of the relative values of the NER and the RER during a period of relative stability and immediately prior to the AFC 1997. Based upon the results of the fourth comparative analysis, the range of disparity between the NER and the RER could have been expected to range between 0.9800 and 1.0053 prior to the AFC 1997. In an effort to balance between the values of the RER as undervalued and overvalued against the NER, the maximum deviation applied in the present study for the purpose of establishing a *gharar* threshold is 0.02 (i.e., between 0.9800 and 1.020). As a result, any values falling within the range are deemed to constitute *gharar yasir* (permissible *gharar*) while values falling outside of the range are deemed to constitute *gharar fahish* (excessive *gharar*). The findings are of profound importance in regards to determining the beginning and end of the value crisis that accompanied the AFC 1997.

According to the *gharar* threshold determined above, the value crisis that accompanied the AFC 1997 begins on 16 July 1997, which is the date that the PPP values initially fell below the lower limits of the *gharar* threshold (i.e., 0.9800). The PPP values are consistently below the lower limits of the *gharar* threshold until 1 August 2010, which is the date that the PPP values fall within the *gharar* threshold for the first time since 16 July 1997. However, five days between 1 August 2010 and 27 August 2010 indicate PPP values falling outside of the *gharar* threshold; and only 29 days between 28 August 2010 and 15 September 2011 fall within the *gharar* threshold. From 16 September 2011 until 31 December 2011, which marks the end of the study period, all PPP values consistently fell within the *gharar* threshold. As a result, 16 September 2011 effectively marks the end of the value crisis arising from the AFC 1997, indicating that the value crisis extended a total of 14 years and 2 months. The finding, however, has profound effects on the *Shariah* compliance of the two principal types of international commutative transactions examined in the present study: spot exchanges and transactions involving deferred payments.

Spot exchanges are exchanges that are concluded immediately following an agreement to engage in a transaction. Although domestic spot exchange transactions are generally completed on the same day, spot exchanges in international transactions are concluded within two (2) days following the conclusion of an agreement (Quirk et al. 1988). International spot exchanges completed between 16 July 1997 and 31 July 2010, during the value crisis

that resulted from the AFC 1997, do not satisfy *Shariah* requirements relating to the prohibition against *gharar*. Even in the event that a spot exchange was completed on the same day and neither the RER nor the NER changed between the conclusion of the agreement and the completion of the transaction (which is highly unlikely given the nature of NERs generally), issues still exist concerning the *Shariah* compliance of such exchanges in relation to *gharar*. The range of potential values that exists between the two exchange rates is significant and excessive during the value crisis and makes the accurate determination of the value of the IDR against the USD, or *vice-versa*, for the purposes of the transaction, which prevents certainty concerning the quantum of the price that accurately reflects the value of the countervalue in the exchange (Zahraa & Mahmor 2002; Rab & Anjum 2011). As such, the two scales cannot effectively be concluded to balance (Chapra 2008). However, spot exchanges concluded on any of the 51 days between 1 August 2010 and 15 May 2011 when the PPP values fell within the *gharar* threshold would arguably be permissible, provided the international commutative transactions were completed within a respective temporal window of permissibility. Generally speaking, spot exchanges would not be deemed permissible until the resolution of the value crisis on 16 September 2011.

Deferred payments, on the other hand, involve a transaction where the period of time between the conclusion of an agreement and the completion of the transaction extends over a longer period of time. In international commutative transactions, the typical amount of time between the conclusion of an agreement and the date of maturity (i.e., when payment is made) consists of a period of 1, 2, 3, 6 or 12 months (Quirk et al. 1988). Any transaction involving deferred payments concluded during the value crisis fail to meet *Shariah* requirements relating to the prohibition against *gharar* due to the prolonged period of time between the conclusion of the agreement and the date of maturity; and the significance of the fluctuations in the range of potential values of the IDR against the USD during the value crisis resulting from the effects of the AFC 1997. While the same situation exists concerning the uncertainty of the value of the IDR against the USD during the period of value crisis regarding international commutative transactions involving spot exchanges, an international commutative transaction involving deferred payments would be subject to a greater range of potential values due to the differences in the local and international valuation of the IDR against the USD during the period between the conclusion of the agreement and the date of maturity, irrespective of the length of the period. As a result, such international commutative transactions could not be argued to be *Shariah* compliant according to prohibitions against *gharar* until the value crisis resolved on 16 September 2011, the point at which the PPP values fell within the *gharar* threshold and maintained such a position consistently.

## CONCLUSION

Traditionally, commodity moneys, such as gold and silver, have been utilized as universal mediums of exchange. The emergence of an international financial system premised upon fiat-based moneys after 1971 eliminated the universality of local mediums of exchange and required exchange ratios to be established for each of the local currencies, leading to the development of NER and later exchange rate systems, such as the RER applied in the present study. In the absence of commodity-based moneys, or moneys consisting of materials with intrinsic value or backed by underlying assets, contemporary fiat-based moneys are based upon empirical examinations of a plethora of factors that determine the confidence level of domestic economic markets and international financial markets in a given contemporary currency. The varying degrees of confidence in a given currency within domestic and international financial markets during and following a financial crisis result in the emergence of a value crisis, which has been demonstrated to be prolonged and result in significant disparity between the rates of exchange emerging from international markets (NER) and the rate of exchange based upon the perceived change in local value of the respective currencies (RER) during the period of study. The absence of a defined underlying commodity creates a situation where differing potential values emerge, resulting in a range of potential exchange rates rather than an exchange ratio between two contemporary currencies, which are increasingly disparate during, and following, periods of financial crisis until the value crisis subsides. The emerging disparity regarding the value of fiat-based moneys during, and following, periods of financial crises raises serious concerns regarding the *Shariah* compliance of international commutative transactions completed during such periods.

The present study examines the AFC 1997 in light of the effects upon the perceived local and international values of the IDR against the USD during the 12 month period preceding the AFC 1997; the period of the AFC 1997; and the during the value crisis that continued after the AFC 1997. The results and subsequent analysis provide a means of determining the threshold of permissible *gharar* regarding the value of one currency against another prior to, and following, a period of financial crisis by utilizing the maximum range of disparity that exists between the RER and the NER prior to the onset of the effects of the financial crisis. Additionally, the results identify the resolution of the value crisis that accompanied the AFC 1997 as occurring in late 2010. Although the RER and NER returned to the equilibrium that existed prior to the AFC 1997, the return was intermittent rather than maintained. Due to exacerbated levels of disparity that exist between the perceived values assigned to the IDR and USD by their respective domestic markets and the value assigned to the IDR and USD by international financial markets, international commutative contracts are not considered to be *Shariah* compliant in accordance with the prohibition

against *gharar*, irrespective of whether the transaction is a spot exchange or an exchange involving a deferred payment, during the value crisis that accompanies, and continues long after, a financial crisis.

The present study is subject to several limitations. Firstly, only one set of reported exchange rates was utilized to determine the NER and the reported exchange rates vary depending upon the institution or organization reporting. Future research may consider tabulating multiple sets of reported exchange rates to determine a more universal NER. Second, the monthly data concerning inflation based upon CPI figures obtained from the governmental agencies of the US and Indonesia for the period examined were only tabulated to the fourth decimal position (second decimal position for percentile based figures). Future research may consider calculating the inflation data to the sixth decimal position (fourth decimal position for percentile based figures) based upon raw CPI data to gain a more accurate measure of the effects of inflation upon the perceived value of a given currency in its domestic market. Third, the present study does not examine the *Shariah* compliance of international commutative transactions in relation to principles of *fiqh muamalat* other than the prohibition against *gharar*. Similar analyses could be undertaken in the future concerning other prohibitions of *fiqh muamalat*; and principles relating to *maslahah* (public good) that could potentially be utilized to 'cleanse' a commutative transaction that is otherwise not *Shariah* compliant. Finally, future research could examine whether a provision could be drafted that mitigates the effects of value uncertainty during and following periods of financial crisis that would ensure the *Shariah* compliance of international commutative transactions.

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